Materials Engineering Branch

TIP*

No. 118 Epoxy Compounds Are Permanent

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Epoxy compounds consist of a large variety of types that contain a wide spectrum of physical properties. There are some properties, however, that most epoxy compounds share. Some of these are high strength, good adhesion to many materials, high hardness, low permeability to most liquids and gases and a high degree of inertness to most solvents. The reason for the stability of these compounds is the type of chemical bonds contained in their formation, which includes extensive chain cross-linking.

The foregoing description of epoxy compounds suggests a high degree of permanence. For many uses in aerospace technology, this is an indispensable attribute. In other words, anything that is bonded, potted, or coated with an epoxy compound should be considered permanently treated with this material. If repairs, modifications, or disassembly are anticipated, epoxy
compounds should not be used unless the part is expendable.

Although it is possible to make repairs on epoxy fabrications, such efforts are generally not successful. Some of the procedures that have been used for making repairs are grinding, sanding, machining, chiseling, burning (with a torch), strong chemical attack or some combination of these techniques. For many types of parts or apparatuses, it would be impossible or even destructive to remove epoxy to effect repairs.

Epoxy compounds are exceedingly useful materials when used with proper planning and thought, but they should always be considered permanent. If disassembly of hardware is anticipated for any reason, adhesives other than epoxies should be considered, e.g., polyurethanes, acrylics, or silicones.

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